Lattice QCD Computing Project

USQCD Computing Resources and User Services

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2007 Annual Review
Thomas Jefferson National Accelerator Facility
May 14-15, 2007

USQCD Computing Resources

Computer	Site	Nodes	Performance (teraflop/s)
QCD	FNAL	127	0.15
3g	JLab	128	0.10
4g	JLab	384	0.54
Pion	FNAL	518	0.86
QCDOC	BNL	12,288	4.20
6n	JLab	256	0.55
Kaon	FNAL	600	2.56
Total		14,302	8.96

First grouping are commodity clusters purchased under SciDAC-1 grant with supplementary funds from FNAL, JLab and the DOE-OHEP.

QCDOC built with funds from DOE-ASCR, OHEP, and ONP.

6n and Kaon are commodity clusters built with LQCD Computing Project funds.

Measured performance is the average of the performances of the inverters of the Dirac operator for domain wall (DWF) and improved staggered (asqtad) quarks.

These codes consume a significant fraction of computing resources; are representative of our full codes.

User Services

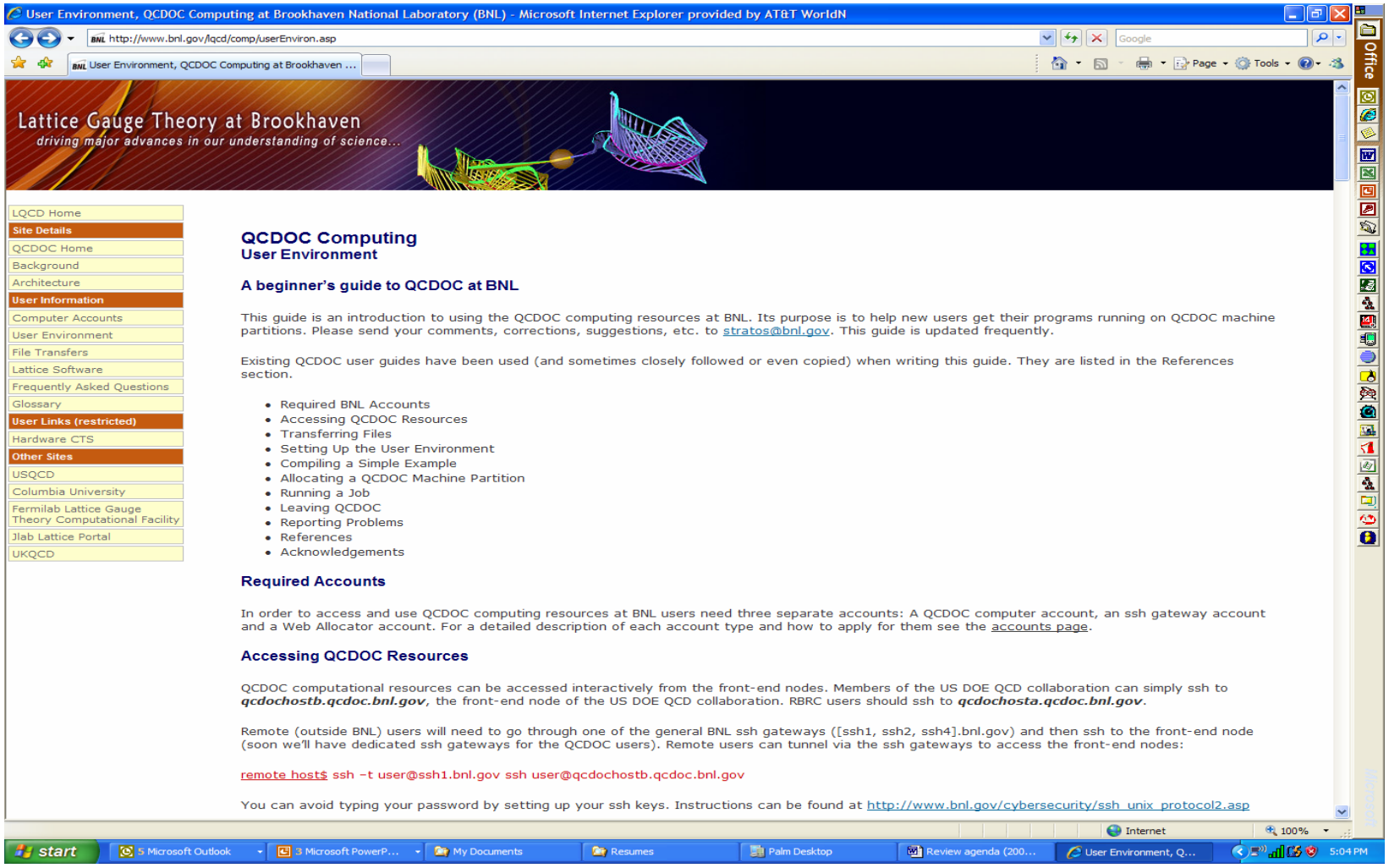
- Processing new account requests
  - Setting new accounts
  - Issuing/managing Cryptocards at FNAL and optionally at BNL
- Establishing storage space (home areas, data areas) with quotas
  - Quotas modified on request
- Archival storage
  - Tape systems at JLab and FNAL
  - RAID disks at BNL
- Backups of home and critical data areas

User Services

- Restores of deleted or damaged data from backups
  - Typical request: restore data accidentally deleted by users
- Problem-reporting systems
  - Each facility provides a problem-reporting system for users
  - Problems are assigned to individuals for analysis resolution
  - Systems provide mechanism for documenting problems
- Web pages, including:
  - Extensive online documentation
  - Links to other sites, USQCD and SciDAC info
  - Status of USQCD machines
  - Status of user jobs and jobs in queue
  - Allocation reports (time used, time remaining)
  - Disk reports (storage used, storage available)

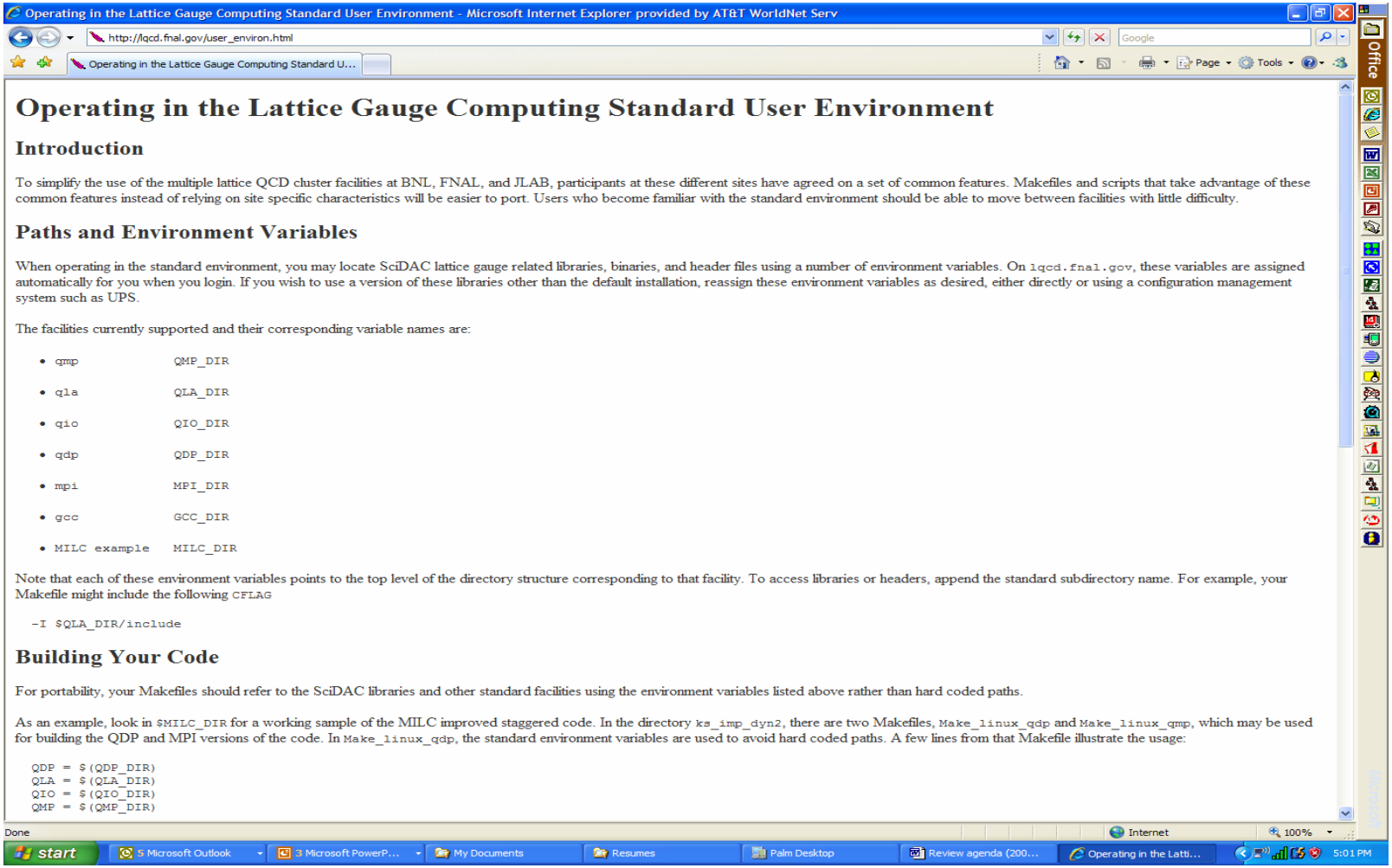
Sample Web Pages

User Documentation



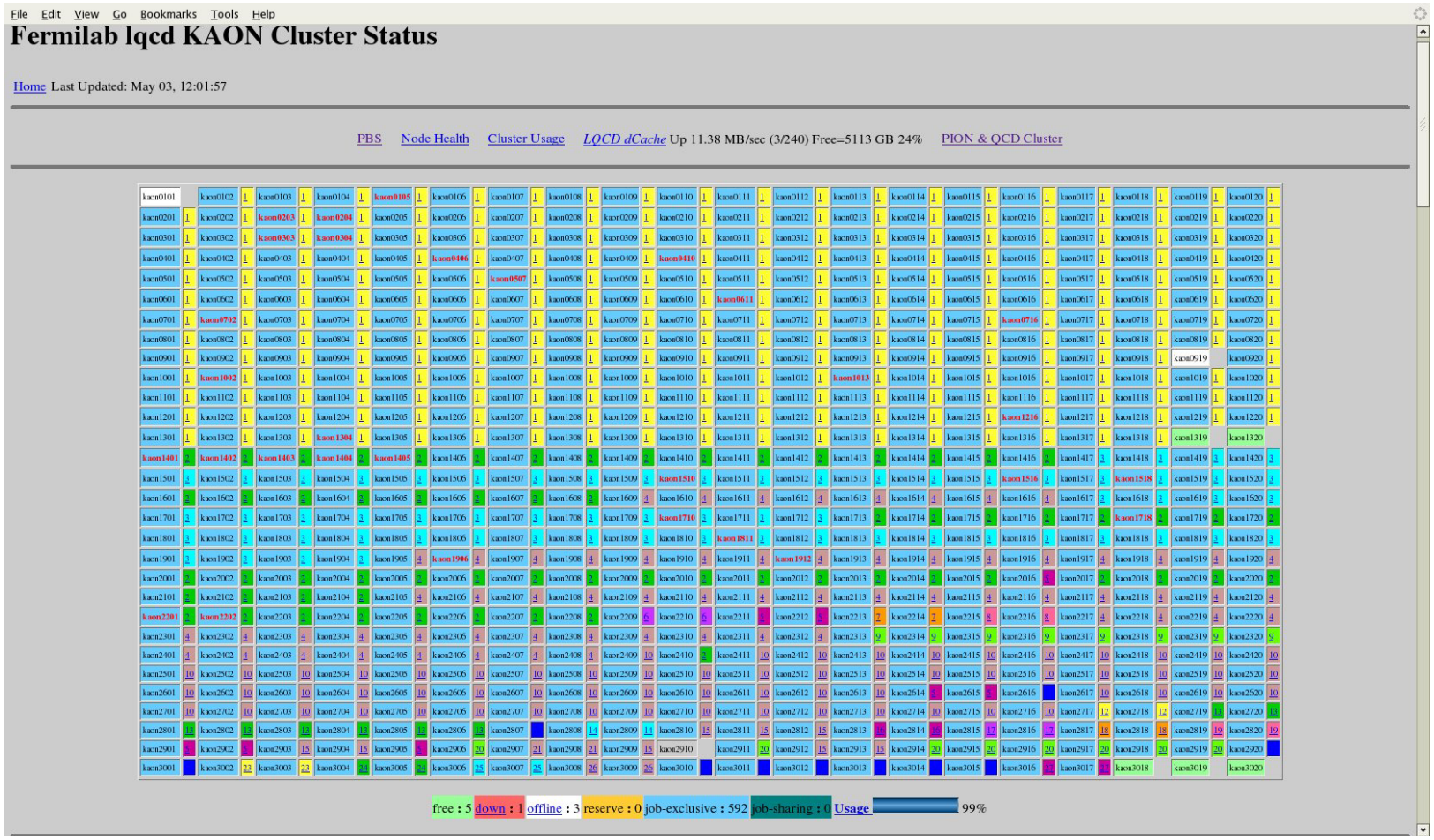
Sample Web Pages

More User Documentation



Sample Web Pages

Kaon Cluster: Node Status



Node colors indicate distinct jobs

Sample Web Pages

FNAL Cluster Usage Reports

File Edit View Go Bookmarks Tools Help

PION & QCD Cluster Usage Report (weekly) Apr 25, 2007 to May 1, 2007

Project	Jobs	Normalized ProcHours	Fraction	Multinode Jobs
fermimilcheavylight	6045	123450.4	92.1	6045
hpqcd	8	2006.3	1.5	8
lqcdadmin	37	2340.5	1.7	16
mixbk	81	5683.5	4.2	81
nplqcd	50	523.9	0.4	0
Totals	**6221**	**134004.6**	**100.0**	**6150**

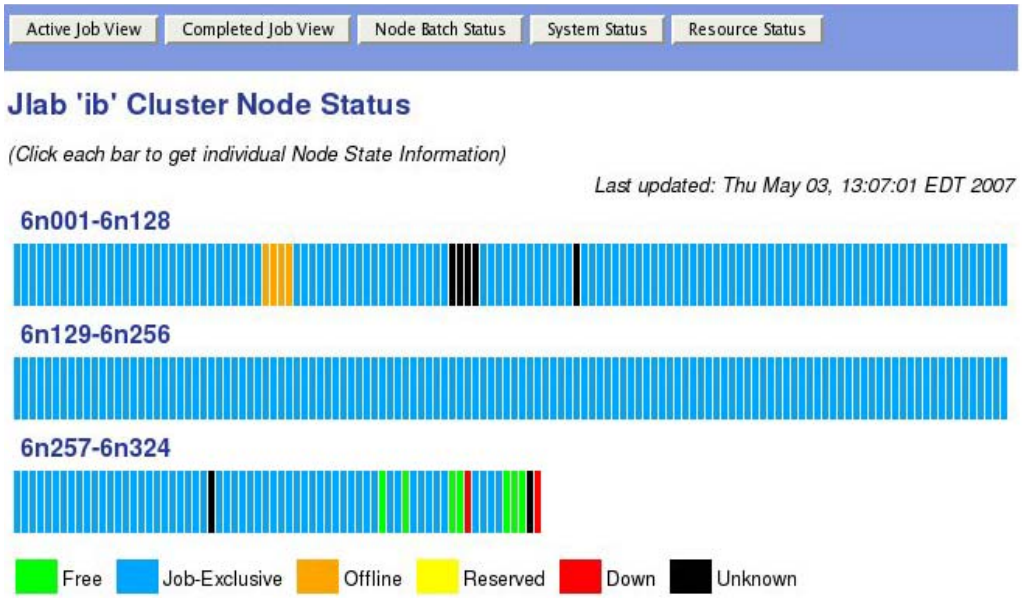
KAON, PION & QCD Cluster Usage Report (year-to-date) Jul 1, 2006 to May 1, 2007

Project	Jobs	Normalized ProcHours	Fraction	Multinode Jobs	Allocation Fraction
cdms	11676	39499.7	0.3	0	0.0
charmonium	530	115648.3	1.0	264	8.6
dynchiral	35766	731238.4	6.4	35753	**284.8**
fermimilcheavylight	151599	3481662.6	30.3	142203	76.6
grid	149	0.4	0.0	7	0.0
hasenfratz	4676	21813.2	0.2	4622	**135.9**
hpqcd	11744	449147.9	3.9	11320	60.0
latticesusy	718	111626.1	1.0	395	69.5
lqcdadmin	3221	249078.7	2.2	2426	0.0
milclat	1433	2934091.2	25.5	1425	92.3
mixbk	12901	1113025.1	9.7	12782	**104.6**
nplqcd	9440	1694957.2	14.7	7809	99.0
usertest	1087	321410.9	2.8	1042	0.0
xqcd	367	242353.9	2.1	341	75.5
Totals	**245307**	**11505553.6**	**100.0**	**220389**	

Usage reports show jobs in progress, fraction of resources allocated per job, and total fraction of user allocation used to date.

Sample Web Pages

JLab Cluster Node Status



Snapshot showing the status of various nodes.

Clicking on bars allows user to "drill down" for more information.

Sample Web Pages

JLab Cluster Job Status

Jlab 'ib' Cluster Jobs Status

'ib' Cluster Server Name - qcdpbs

Ib Queue: 39 total job (R:12 Q:27 H:0) walltime: 24 h (max), 04 h (def)

Job Id	Job Name	Owner	State	Cores	CPU Time	Wall Time
46846	seq0-6n.csh	engel	R	128	00:00:18	05:31:36
46847	seq0-6n.csh	engel	R	128	00:00:17	01:55:17
47984	cl3_b5p35_notad_z_x3p700_um0p0610_n0p500	edwards	R	64	00:00:12	05:36:36
48136	QII_m30_48_15_1	nilmani	R	32	00:06:59	07:11:43
48137	QII1_m30_48_15_	nilmani	R	32	00:07:50	07:05:02
48143	bigjob_5.pbs	bjoo	R	32	00:01:53	04:09:05
48145	bb0-6n.csh	engel	R	32	00:01:21	03:10:58
48146	bb0-6n.csh	engel	R	32	00:01:19	01:48:15
48147	bb0-6n.csh	engel	R	32	00:01:19	01:34:12
48148	bb0-6n.csh	engel	R	32	00:01:20	00:57:54
48155	bigjob_6.pbs	bjoo	R	32	00:00:51	02:04:36
48157	test.csh	nilmani	R	32	00:00:30	00:53:50
46848	seq0-6n.csh	engel	Q	0		
46849	seq0-6n.csh	engel	Q	0		
46850	seq0-6n.csh	engel	Q	0		
48120	seq0-6n.csh	engel	Q	0		
48121	seq0-6n.csh	engel	Q	0		
48122	seq0-6n.csh	engel	Q	0		
48123	seq0-6n.csh	engel	Q	0		
48124	seq0-6n.csh	engel	Q	0		

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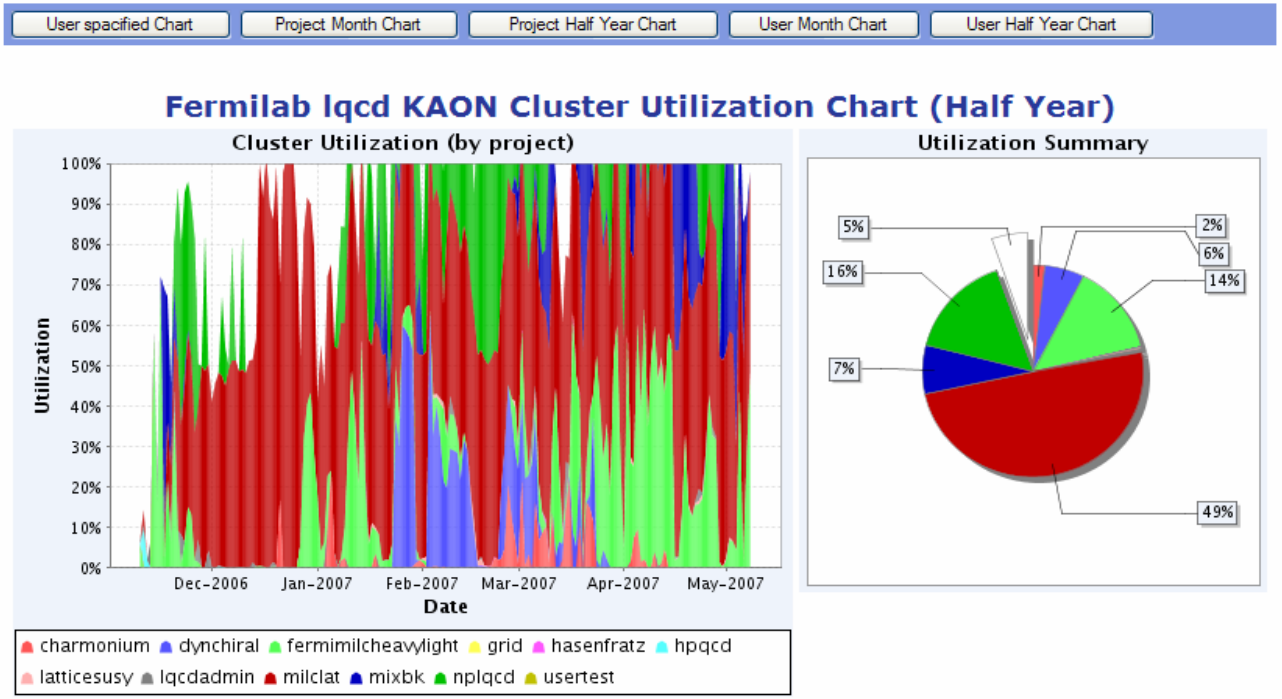
Last updated: Thu May 03, 13:07:01 EDT 2007

Jobs status reports show jobs in progress, job owner, state, resources allocated, and cumulative CPU time.

Sample Web Pages

FNAL Cluster Utilization (shown by project)



Data shown for the Kaon cluster over a 6-month period

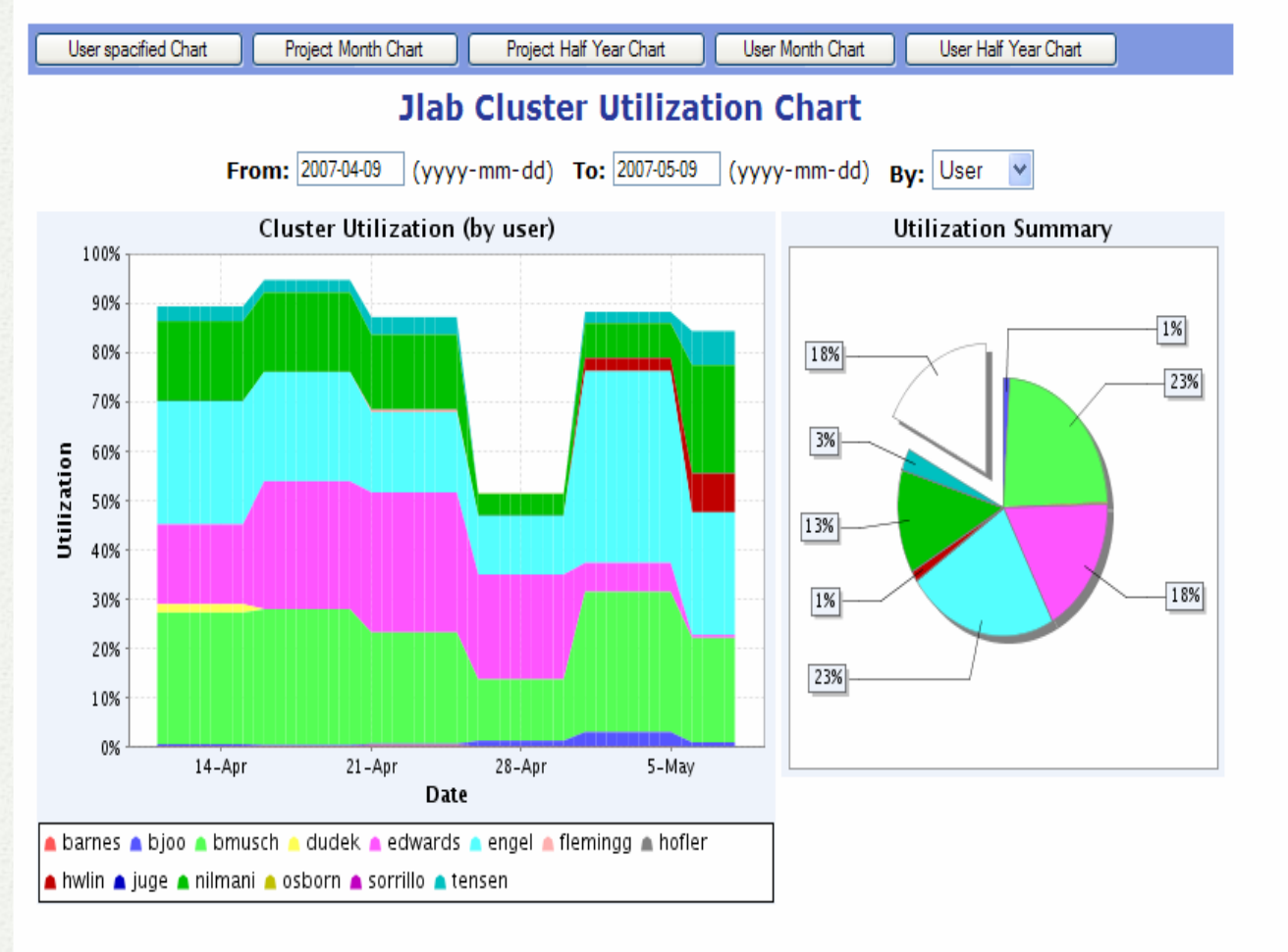
Data shows ramp-up of Kaon cluster into full production use

Same software used at FNAL and JLab

Provides for commonality in tracking and reporting usage statistics

Sample Web Pages

JLab Cluster Utilization (shown by user)



Data shows utilization by user over a one-month period

User Services

- Cyber Security Infrastructure
  - Computing resources at all three labs are managed under the respective lab computer security policies
- Special Requests:
  - Queue policy modifications for high priority runs (for example, benchmarking or software prototyping)
  - Special provisioning (for example, special kernels for software investigations)

Summary

- A significant amount of computing resources are available at JLab, BNL, and FNAL for use by the USQCD community, with more becoming available annually.
- User support is provided at all three sites, to help with everything from the simple (setting up accounts) to the complex (setting up special privileges to run specific tests outside of normal allocations).
- In accordance with MOUs between the project and the labs, many of these services are provided as in-kind support to the project.
- Extensive online documentation exists at all three sites.
- User feedback and suggestions for improvement are encouraged from the community.

Questions?